

# Measure Up

Fall 2007

Assessment news for high school teachers



## Facts About NAEP 2008

- From March 17 to May 23, 2008, over 13,000 seventeen-year-olds will take the NAEP long-term trend assessments in reading or mathematics.
- From January 28 to March 7, 2008, over 18,000 twelfth-graders will take the NAEP assessment in reading, mathematics, or science.
- Over 400 high schools have been selected to participate in NAEP 2008.
- Over 600 NAEP staff will administer NAEP 2008 to students.

## LONG-TERM TREND:

## Three decades of student performance in reading and mathematics

The NAEP program includes the long-term trend and the main assessments. The long-term trend component uses assessments that remain substantially unchanged each time a subject is assessed, allowing students' progress in a subject to be measured over a long period of time. The main assessment, on the other hand, is periodically updated to reflect contemporary changes in educational policies, methods, and institutions, and results in shorter trend lines. Additionally, students are sampled by age for long-term trend (9-, 13-, and 17-year-olds) and by grades 4, 8, and 12 for the main assessments. (Additional key differences between NAEP's long-term trend and main assessments are discussed on page 4.) The last long-term trend assessment was administered in 2004. Key findings are listed below.

- ★ The national average score for 17-year-olds in reading showed no statistically significant difference between 2004 and 1999 or 1971.
- ★ In mathematics, the national average score for 17-year-olds in 2004 was not statistically different from the score either in 1973 or in 1999. Black 17-year-olds' average reading score was higher in 2004 than in the first assessment year (1971). The reading score gap between White and Black 17-year-olds decreased by 24 points between 1971 and 2004.
- ★ Hispanic 17-year-olds' average reading score was higher in 2004 than in 1975. The White-Hispanic score gap in reading at age 17 decreased by 11 points between 1975 and 2004.
- ★ Average mathematics scores for White, Black, and Hispanic 17-year-olds increased from the first assessment year (1973) to 2004 by 3, 15, and 12 points, respectively.
- ★ In mathematics, both the White and Black and White and Hispanic score gaps at age 17 were smaller in 2004 than in 1973, by 12 and 9 points, respectively.
- ★ The percentage of 17-year-olds who reported taking calculus nearly tripled between 1978 and 2004, and the percentage of students taking second-year algebra increased from 37 percent in 1978 to 53 percent in 2004.
- ★ In 2004, the percentages of Black and Hispanic 17-year-olds who reported they had taken second-year algebra had doubled from the percentages reported in 1978.
- ★ The percentage of Hispanic 17-year-olds taking calculus quadrupled between 1978 and 2004, from 3 to 14 percent. ■

Source: Perie, M., and Moran, R. (2005). *NAEP 2004 Trends in Academic Progress: Three Decades of Student Performance in Reading and Mathematics* (NCES 2005-464). U.S. Department of Education, Institute of Education Sciences, National Center for Educational Statistics. Washington, DC: Government Printing Office.



## LONG-TERM TREND: Reading

The long-term trend reading assessment was designed to measure students' ability to locate specific information; make inferences based on information in two or more parts of a passage; and identify the main idea in a passage. The assessment requires students to read and answer questions based on a variety of materials, including informational passages, literary

texts, and documents. Students' comprehension of these materials is assessed with both multiple-choice and constructed-response questions. The set of reading passages and questions included in the trend assessments has been kept essentially the same since 1984. See below for sample questions and 2004 performance results for 17-year-olds. ■

### Question 1:

85% of 17-year-olds gave the correct response, C.

### Question 2:

80% of 17-year-olds gave the correct response, C.

### Question 3:

19% of 17-year-olds gave an elaborated or satisfactory interpretation. A satisfactory response gave at least two ways (at least one of which is somewhat elaborated) the writer made the javelin throw seem to take a long time. Or, they give a generalization and support it, but compared to "elaborate" papers, the presentation seems underdeveloped or uneven.

### 1. Read the sentences in the paragraph below and choose the sentence that does NOT belong with the others.

*Colorado is a western state with many mountains. Colorado has more than 1,000 peaks two miles high. Gold was discovered in Colorado in 1859. A total of 54 of the 69 highest mountains in the United States are in Colorado.*

- A) Colorado is a western state with many mountains.
- B) Colorado has more than 1,000 peaks two miles high.
- C) Gold was discovered in Colorado in 1859.
- D) A total of 54 of the 69 highest mountains in the United States are in Colorado.

### Questions 2 and 3 are based on the story below.

### 2. What is the main reason the writer wrote this story?

- A) To express an athlete's feeling of failure.
- B) To provide information about javelin throwing.
- C) To describe how it feels to throw the javelin.
- D) To encourage people to take up javelin throwing.

### 3. Here is one student's impression of the story:

*When I watch throwing javelin on television, everything seems to happen in a split second. First, the javelin is in the thrower's hand and the next thing you know the official is out there measuring how far the javelin was thrown. In this story, though, throwing the javelin seems to take a long time.*

Think about the story. Think about the way in which the writer created the impression that this javelin throw took a long time. Write your explanation on the lines provided.

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### Throwing the Javelin

The scent of honeysuckle seemed to linger in the air and joined itself with the sweet odor of freshly cut grass. I slipped out of my bright red sweats and flung them to the base of the tree. I picked up the javelin, stuck point down in the turf. I stretched my arms with the javelin behind my neck. Out of habit, I stood and held the javelin in my left hand, and with the thumb of my right forced small clumps of dirt from the tip. I searched for a target. Picking a spot in a cloud moving towards me I cocked the javelin above my shoulder and regulated my breathing. My right foot was placed on the first mark and my left foot rested behind. My eyes were focused on one abstract point in the sky. Pierce it. I built up energy. Slowly, my legs flowed in motion, like pistons waiting for full power and speed. I could feel my legs churning faster, the muscles rippling momentarily, only to be solidified when foot and turf met like gears. Hitting the second mark, I escaped from the shadow of the tree and was bathed in sunlight....Left foot forward...javelin back, straight back,...turn now, five steps...three, four...stretch, the clouds, the point...turn back, throw the hips...chest out...explode through the javelin...terminate forward motion, release.

The muscles of my right leg divided in thirds just above my knee, as the full weight of my body in motion was left to its support. Skipping, I followed through and watched the quivering javelin climb as it floated in the oncoming wind. For a moment, it reflected the sunlight and I lost sight of the javelin. The javelin landed quickly, piercing the ground. I heaved in exhaustion, and perspiration flowed from my face and hands. Before me the field stretched and I attempted to evaluate my throw. I was pleased. The smell of honeysuckle again drifted into my senses and somehow, I had a feeling of accomplishment I could just as easily have experienced had I thrown poorly.

## LONG-TERM TREND: Mathematics

The long-term trend mathematics assessment was designed to measure students' knowledge of basic facts; ability to carry out numerical algorithms using paper and pencil; knowledge of basic measurement formulas as they are applied in geometric settings; and ability to apply mathematics to daily-living skills (such as those related to time and money). The assessment has a computational focus and contains a range of multiple-choice and constructed-response questions. It covers the following topics: numbers and numeration; measurement; shape, size, and position; variables and relationships; and

mathematical application, knowledge, skills, and understanding. The mathematics trend assessments contain questions designed to measure performance on sets of objectives developed by nationally representative panels of mathematics specialists, educators, and other interested parties. Although some changes were made from assessment to assessment prior to 1990, some questions were retained from one assessment to the next to measure trends in achievement over time. See below for sample questions, student responses, and 2004 performance results for 17-year-olds. ■



**1. Find the products.**

$$3 \times 2\frac{1}{3} =$$

**2. Carlos' basketball team won 75% of its games last season. If they played 80 games, how many games did they win?**

- A) 20    B) 60    C) 68    D) 75

**3. The following statement is true: "If Sally goes to the movie, Mark will go also." Which statement below could NOT be true?**

- A) Sally and Mark both go to the movie.  
B) Sally goes to the movie and Mark does not go.  
C) Mark goes to the movie and Sally does not go.  
D) Neither Sally nor Mark goes to the movie.

**A triangle has a 120° angle. Indicate whether each of the following MUST be true, MAY be true or CANNOT be true about the triangle.**

**4. The triangle is a right triangle.**

- |                 |                |                   |
|-----------------|----------------|-------------------|
| Must<br>be true | May<br>be true | Cannot<br>be true |
| (A)             | (B)            | (C)               |

**5. The triangle is an isosceles triangle.**

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|-----------------|----------------|-------------------|
| Must<br>be true | May<br>be true | Cannot<br>be true |
| (A)             | (B)            | (C)               |

**6. The triangle is equilateral.**

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|-----------------|----------------|-------------------|
| Must<br>be true | May<br>be true | Cannot<br>be true |
| (A)             | (B)            | (C)               |

**7. According to the table, what is the total amount of protein contained in two boiled eggs and one-half cup of whole milk?**

Answer: \_\_\_\_\_

Nutritive Value of Certain Foods				
	Measure	Calories	Protein (grams)	Carbohydrates (grams)
Banana, raw	1	100	1	26
Beef hamburger	3 oz.	245	21	0
Whole milk	1 cup	160	9	12
Doughnut	1	125	1	16
Eggs, boiled	2 eggs	160	13	1

• To use released long-term trend questions in the classroom, teachers should visit <http://nces.ed.gov/nationsreportcard> and select "Sample Questions."

• From there, teachers can select "Search Options" and "Long-Term Trend Questions," followed by the subject and age 17. A series of questions will appear and teachers can review the questions, sample student responses, and performance data for students nationwide.

**Question 1:**

48% of 17-year-olds gave the correct response, 7.

**Question 2:**

72% of 17-year-olds gave the correct response, B.

**Question 3:**

55% of 17-year-olds gave the correct response, B.

**Question 4:**

70% of 17-year-olds gave the correct response, C.

**Question 5:**

66% of 17-year-olds gave the correct response, B.

**Question 6:**

58% of 17-year-olds gave the correct response, C.

**Question 7:**

40% of 17-year-olds gave the correct response, 17.5.

### What Are the Differences Between Long-Term Trend NAEP and Main NAEP?

Although long-term trend and main NAEP both assess mathematics and reading, there are four main differences—the content assessed, the students selected, the administration timing, and the results reported. These differences mean that results from long-term trend (LTT) and main NAEP cannot be compared directly, although comparisons of the patterns over time of the two assessments, especially for student demographic groups, may be informative, keeping in mind the content differences.

	Long-Term Trend Assessment	Main NAEP Assessment
<b>Purpose</b>	Measures student performance in mathematics and reading every 4 years. Last reported for 2004; will be reported next for 2008.	Measures student performance in mathematics and reading every 2 years, most recently in 2007. Other subjects are also assessed.
<b>Content Assessed</b>	<p>Has remained essentially unchanged since first administration (1971 for reading, 1973 for mathematics), although some changes were initiated in 2004. <b>Note:</b> Questions and assessment instrument are very different from main NAEP; the plan for the LTT assessment has been static, whereas frameworks for main NAEP change.</p> <p><b>Reading</b> features shorter passages, and focuses on locating specific information, making inferences, and identifying the main idea of a passage. Students respond to questions in multiple-choice format; there are also a few questions requiring an extended answer.</p> <p><b>Mathematics</b> focuses on basic computational skills in four content areas: numbers and operations, measurement, geometry, and algebra. Students respond to questions in multiple-choice format; there are also a few short answer and a few extended answer. Students are not asked to show or explain their work.</p>	<p>Changes about every decade to reflect changes in curriculum in the nation's schools. New frameworks reflect these changes.</p> <p><b>Reading</b> requires students to read longer passages or pairs of passages; measures a range of reading skills, from identifying explicitly stated information, to making complex inferences about themes, to comparing multiple texts on a variety of dimensions. Students respond to questions of three possible types: multiple choice, short answer, and extended answer.</p> <p><b>Mathematics</b> focuses on five content areas: number properties and operations, measurement, geometry, data analysis and probability, and algebra. Students respond to questions of several possible types: multiple choice, short answer, and extended answer. Students may be asked to explain their work.</p>
<b>Students Sampled</b>	Selected by age (9-, 13-, and 17-year olds) to represent the nation. Smaller sample sizes than in main NAEP restrict comparisons to main demographic groups. In 2004, results could be reported only for White, Black, and Hispanic students, and for public schools.	Selected by grade (4, 8, and 12). Students represent the nation in even-numbered years, but also represent states and selected urban districts in odd-numbered years. Larger sample sizes usually permit reporting results for smaller minorities, such as Asian/Pacific Islanders and American Indians.
<b>Administration</b>	<p>Assessment every 4 years, throughout the school year:</p> <ul style="list-style-type: none"> <li>• October through December: Age 13</li> <li>• January through March: Age 9</li> <li>• March through May: Age 17</li> </ul>	Mathematics and reading assessed every 2 years, but assessment of other subjects requires administration of main NAEP each year from late January through early March.
<b>Results Reported</b>	Provides national results only on performance and how it has changed over time. Performance levels are reported using scale scores.	Provides results on performance and how it has changed over time using scale scores as well as achievement levels ( <i>Basic</i> , <i>Proficient</i> , and <i>Advanced</i> ). Results have been produced for the nation and the participating states and other jurisdictions since 1990, and for selected urban districts (on a trial basis) since 2002.

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